

VARIABLE DISPLACEMENT VANE PUMP  
WITH VARIABLE TARGET REGULATOR

ABSTRACT

A variable displacement vane-type fluid pump is provided which permits  
5 improved regulation of the pump discharge such that the pump can meet the various  
requirements of lubrication for internal combustion engines at all speeds with  
minimized use of power. Of course, the vane pump may also be utilized in a wide  
range of power transmission and other fluid distribution applications. The variable  
displacement vane pump of the invention may utilize both hydrostatic and  
10 mechanical assistance in radially positioning its vanes to ensure efficient and quiet  
operation of the pump and to facilitate priming of the pump. The vane pump of the  
invention may also use both hydrostatic and mechanical actuators to control the  
position of its containment ring or eccentric ring and hence, regulate the output of the  
pump. According to yet another aspect of the present invention, to prevent inlet flow  
15 restriction or cavitation, a valve may be provided to permit some of the pump outlet  
or discharge flow to bleed into the pump inlet to provide needed velocity and energy  
to the fluid flow into the pump inlet